

**Southern Range Limits of the Rufous-crowned Emu-Wren.**—Serventy and Whittell (*Birds of Western Australia*, 5th ed., 1976) give the southern boundary of the Rufous-crowned Emu-Wren (*Stipiturus ruficeps*) as North West Cape, Wiluna and Naretha. On the peninsula projecting northwards as North West Cape, it is plentiful and inhabits big domes of *Triodia* (Carter, *Emu* 3, 1903: 37); in the vicinity of Wiluna, it was collected by Whitlock (*Emu*, 1910, 9: 181-219) on *Triodia* sandplain at Borewell; and near Naretha, Collins (*S. Aust. Orn.*, 1943, 12: 198-201) recorded it in the semi-arid mallee-*Triodia* country to the north, not in the shrub steppe of the Nullarbor Plain.

Some recent observations extend these limits further south. Moriarty (*Emu* 72: 1972: 5) lists it as occurring in open shrub-land on *Triodia*-sandplain on Wanjarri, 95 kilometres south-south-east of Wiluna. G. M. Storr and I saw a party on *Triodia*-marble gum-blackboy sandplain with dunes, 66 kilometres south-west of Wiluna, on the Sandstone road on September 4, 1966.

Still further south, I saw five pairs and/or parties on the plateau of the Kennedy Range, near Range Bore, east of Carnarvon, on May 21-22, 1975. A pair was collected for the Western Australian Museum and an empty nest was found in a clump of *Triodia*. The birds were in pure domes of *Triodia* and in *Triodia* mixed with low heath shrubs, *Hakea*, *Calothamnus* and *Pileanthus*. The plateau of the Kennedy Range is covered with longitudinal sand dunes and sandplain vegetated mainly with *Triodia* and several heath shrubs including *Bauksia ashbyi*, *Verticordia forrestii*, *Pileanthus peduncularis*, *Calytrix muricata* and *Grevillea eriostachya*.

Ford and Parker (*Emu*, 1974: 184) point out that the distributions of *Stipiturus ruficeps* (including its subspecies *mallee*) and the Striated Grass-Wren (*Amytornis striatus*) are both dependent on *Triodia*, so are fairly similar. I searched without success for *A. striatus* on the Kennedy Range. An interesting locality additional to those listed by Ford and Parker for *A. striatus* is the marble gum—*Triodia* sandplain with dunes, 10 km west of Agnew; here N. Kolichis, while with P. J. Fuller and me, saw an individual on July 18, 1975.

Eckert (*S. Aust. Orn.*, 27, 1977: 186) shows that in South Australia the emu-wrens *S. malachurus* and *S. ruficeps mallee* are marginally sympatric. The inland-most occurrence of *S. malachurus* in Western Australia is from sandplain-heath, 56 kilometres south-east of Mt. Holland (Ford, *W.A. Naturalist*, 1970, 11: 117) a huge distance from the nearest record of *S. r. ruficeps*. The closest area of contact between these species in Western Australia appears to be on the mid-western coast because *malachurus* occurs on Dirk Hartog Island and *ruficeps* is on the *Triodia* sandplains between North-West Cape and the Kennedy Range.

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**Ecological Notes on Carnac Island Tiger Snakes.**—Carnac I. is one of only three islands around the Western Australian coast known to have populations of Tiger Snakes *Notechis scutatus*, present. During 1975-77 I spent 70 days on Carnac I. during which I recorded the distribution, abundance and length (estimated) of nearly all snakes seen on the island. Each visit was of one week, during which all parts of the island were walked over many times.

Carnac I. is small (area 16 ha), low (maximum elevation 17 m), and about 4 km north of Garden I. and 8 km west of Woodman Point. It is part of a calcarenite ridge, now largely submerged, and lacks swamps, the usual habitat of Tiger Snakes on mainland Western Australia (Glauert, *W.A. Nat.*, 1, 1948: 139-141). There are no frog species, but four colonial nesting seabird species breed there. In order of abundance these are Silver Gull, Bridled Tern, Crested Tern and Wedge-tailed Shearwater. Gull chicks were recorded as eaten by snakes by Nicholls (*Aust. J. Zool.*, 22, 1974: 63-70). Mice are also present, and doubtless form part of the diet. Before 1969 Rabbits occurred, and I have been told that they were eaten by snakes.

TABLE 1.—NUMBER AND SIZE OF TIGER SNAKES SEEN ON CARNAC I., WITH INFORMATION ON WEATHER CONDITIONS AND ABUNDANCE OF POSSIBLE PREY.

Dates	No. snakes	Length (cm)	Weather	Prey
20.-27.1.75	0	—	Hot, Fine	Many Mice
11.-17.3.75	1	60	Fine	
29.4.-5.5.75	2	70, 90	Mostly Fine	2 Gull Chicks
24.-30.6.75	9	not recorded	Wet	Mice active Many Gull Chicks
5.-11.8.75	1	50	Some Rain	Mice active Many Gull Chicks
23.-29.9.75	2	60, 90	Mostly Fine	Mice active Many Gull Chicks
11.-17.11.75	9	50, 50, 70, 60-90, 60-90, 80, 80, 90-	Fine, Sunny	Mice active Few Gull Chicks
31.8.-6.9.76	3	20, 50, 90	Mainly Wet	Many Gull Chicks
10.-16.11.76	13	10x80, 3x90	Gales, Sunny later	Mice active Few Gull Chicks
19.-24.1.77	3	60, 60, 80	Hot, Sunny	Mice active

Table 1 shows that the greatest number of Tiger Snakes was seen in June and November. Snakes were apparently active in wet periods, and less so in hot weather. I have no information on their activity at night. Only two snakes were seen on bushes; the rest were on the ground. Of the 43 sightings of snakes made, 25 were in the south-western gull rookery, and 13 in the *Acacia rostellifera* area on the eastern side of the island. None was seen on the large southern peninsula, where there is also a large gull rookery, and where from time to time the only Pied Cormorant colony is found on the island. No snakes were seen on the three beaches around the island. I have had reports from yachtsmen who visited the island 20-30 years ago that snakes were often seen on the eastern beach.

Snakes varied between 50-90 cm in length, although one 20 cm in length was seen in September, 1976. This was presumably newly born. On the mainland, in Cape Le Grand National Park and on Vancouver Peninsula, Albany, I have seen Tiger Snakes 180 cm in length. It appears, then, that the Carnac population is a dwarf one. In view of the apparent abundance of food on the island, this is hard to explain, and warrants detailed study. On islands in Bass Strait, Tiger Snakes may reach 140-200 cm in length, and so do not show dwarfism (Green, *Rec. Queen Vict. Mus.*, 1969: No. 34; Green and McGarvie, 1971, *ibid.* No. 40, D. L. Serventy pers. comm.). On Barrow I., Western Australia, the Mulga Snake *Pseudochis australis* is half the length of specimens on the opposite mainland (Smith, *W.A. Nat.*, 13, 1976: 135). It would be interesting to study the length of island populations of other species such as the Carpet Snake and Dugite.

The behaviour of the Carnac snakes is placid: none was aggressive to me. Sometimes I prodded snakes with a 2 m long pole. They responded by flattening the head and displaying the yellow stripes more prominently, but in no case did a snake strike at the pole. A few times I nearly trod on a snake, but it retreated quickly into the bush without striking. Tiger snakes on the Bass Strait islands are also unaggressive (D. L. Serventy, pers. comm.).

In conclusion, I think the Carnac Tiger Snake population deserves proper ecological study, especially since it lives in a habitat so unlike that on the mainland. It is a pity their ecology was not studied prior to the removal of the rabbits. It is possible that the rabbits (put on the island in the 1820s to succour shipwrecked mariners and again sometime after 1934 (D. L. Serventy, pers. comm.)) were an important part of the diet of the snakes.

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Australian Research Grants Committee and the Zoology Department, University of Western Australia. The Wildlife Authority authorized my camping on the island. I thank Dr Serventy for his comments on an earlier version of this note.

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## OBITUARY

### IVAN CARNABY (1908-1974)

Ivan Clarence Carnaby, an Honorary Life Member of the Club and one of the most original of recent amateur ornithologists in this State, died at too early an age at the Boyup Brook Hospital on November 10, 1974. He suffered a heart attack as he was preparing his vehicle for a field trip to the Kimberley Division. He was born at Subiaco on July 24, 1908. His father, a genial moustached figure, was well-known on the Swan River as the proprietor of a popular boat-shed at Nedlands until he died in 1935. The family lived in a large two-storied house at no. 20 The Avenue.



Ivan Carnaby, 1946

Ivan had little formal schooling as he was troubled with bronchitis throughout his childhood. In 1922 his father bought an orchard at Parkerville so that Ivan could be in the country each winter to get away from the damp air. One or other brother stayed with him. From early youth he was interested in birds and at Parkerville he started an egg collection with which he persevered for the rest of his life. Right from the start he kept notes on all the nests he found, data which proved very productive to other workers. Late in 1927 the orchard was passed in as a deposit on the purchase of a wheat farm at Lake Grace. This also was a family concern. The brothers shared work on the wheat